



Petition Under 37 C.F.R. §1.144

Docket W2K1077

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: YOSHIDA, AKITO DOCKET NO.: W2K1077
SERIAL NO: 10/082,472 EXAMINER: ZARNEKE
FILED: 02/22/2002 ART UNIT: 2891
TITLE: A STACKING STRUCTURE FOR SEMICONDUCTOR DEVICES
USING A FOLDED OVER FLEXIBLE SUBSTRATE AND METHOD
THEREFOR

Mail Stop: Petitions
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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July 19, 2005

I hereby certify that on the 19th day of July, 2005, this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450.



Jeffrey D. Moy

PETITION TO THE DIRECTOR UNDER 37 C.F.R. §1.144

Dear Sir:

This petition is in response to an Office Action dated May 19, 2005, in which the Examiner has made final a Restriction

Requirement dated October 19, 2004. Applicant requests reconsideration of the Examiner's withdrawal from consideration of pending claims 1-12, 21-26, and 29-30 as being directed to a non-elected invention under 37 C.F.R. §1.114. Applicant respectfully submits that the Restriction Requirement dated October 19, 2004 is not properly made and should be reversed.

STATEMENT OF FACTS

The Examiner has erroneously withdrawn claims 1-12, 21-26, and 28-30 from consideration for allegedly being directed to a non-elected invention.

The prosecution history for this case may be generalized as follows. In an Office Action dated October 18, 2002, the Examiner issued a first Restriction Requirement directed towards then pending claims 1-20. The Examiner stated that restriction to one of the following inventions was required: (I) claims 1-12, drawn to a product, classified in Class 257, subclass 1+; and (II) claims 13-20, drawn to a process, classified in Class 438, subclass 106+. In an Amendment Letter dated December 11, 2002, Applicant elected to prosecute the product Group (I) claims 1-12 to prosecute and added additional claims 21-28 all of which were drawn to a semiconductor stacking structure as shown and described in the patent application as originally filed.

Applicant has filed several Amendment Letters and an RCE in response to Office Actions sent by the Examiner. Each of the Amendment Letters further defined the elected claims of the semiconductor stacking structure. In a first Office Action dated May 11, 2004 after the filing of the RCE, the Examiner rejected claims 1-12 and 21-28 based on a new reference. In response to the May 11, 2004 Office Action, Applicant submitted an Amendment Letter dated August 6, 2004 amending claims 1, 11, and 21 and adding new claims 29 and 30 to further define the semiconductor stacking structure. The Examiner contends in the Office Action dated October 19, 2004 that "the original Claims 1, 11, and 21 were drawn to a die coupled to the substrate via metal layers wherein the flap portions are coupled to the upper surface of the die; while amended Claims 1, 11, and 21 are drawn to a die wire-bonded and encapsulated to the metal layers wherein the flap portions are coupled to the upper surface of the encapsulant." The Examiner claims in the Office Action that Applicant has constructively elected the originally presented invention and that the amended claims are independent or distinct. The Examiner withdrew the amended claims from consideration as being directed to a non-elected invention.

Applicant filed a Notice of Appeal and an Appeal Brief was filed on January 28, 2005 contending that the Examiner's withdrawal

of pending claims 1-12, 21-26 and 29-30 as being directed to a non-elected invention was improperly made and not well founded. On March 2, 2005, the Examiner mailed a Notice of Defective Appeal stating that the Appeal was dismissed since the claims were not twice rejected and because restrictions are not appealable issues. The Examiner attempts to clarify his position on the second restriction dated October 19, 2004 by stating that the application contains claims directed to the following distinct species:

“Species 1 (PREVIOUS CLAIMS): a die electrically connected to a substrate having flap portions which are coupled to an upper surface of the semiconductor device; and

Species 2 (NEW CLAIMS): a die electrically connected to a substrate using wirebonds, wherein the die and wirebonds are encapsulated, and having flap portions that are folded over onto the upper surface of the encapsulant.”

The Examiner states that under 35 U.S.C. 121, Applicant is required to elect a single disclosed species for prosecution.”

In an Amendment Letter dated March 21, 2005, Applicant traversed the Restriction Requirement and elected to prosecute the claims of Species 2 since the Examiner’s statement required Applicant to elect a single disclosed species for prosecution.

The Examiner sent a Notice of Non-Responsive Amendment dated April 5, 2005 stating that the Amendment Letter dated March 24, 2005 was directed to non-elected subject matter. The Examiner has now mailed out an Office Action dated May 19, 2005 finalizing the

Restriction Requirement. Applicant petitions the Restriction Requirement which has been finalized in the Office Action dated May 19, 2005.

The Examiner contends that the amended claims 1, 11, and 21 are independent or distinct from the originally presented claims.

In claim 1 as originally filed, Applicants claim:

A semiconductor stacking structure comprising:
a first semiconductor device; and
a flexible substrate coupled to a bottom surface of the first semiconductor device wherein the flexible substrate is folded over on at least two sides to form flap portions which are coupled to an upper surface of the first semiconductor device and covers only a portion of the upper surface of the first semiconductor device.

Applicant has amended claims 1, 11, and 21 to claim the use of wirebonds for electrically coupling the semiconductor die to the metal layer. Claim 1 as now amended reads as follows:

A semiconductor stacking structure comprising:
a semiconductor die;
a flexible tape substrate having at least one metal layer for electrical connections wherein the flexible tape substrate is coupled to a bottom surface of the semiconductor die;
wirebonds for electrically coupling the semiconductor die to the metal layer; and
an encapsulant covering the semiconductor die and the wirebonds;
wherein the flexible tape substrate further comprises a plurality of flap portions and each flap portion is folded along a side surface and an upper surface of the encapsulant;
wherein the flap portions do not overlap one another and cover only a portion of the upper surface of the encapsulant;

wherein the folded flap portions have an exposed metal layer.

The Examiner contends in the Office Action dated October 19, 2004 that "the original Claims 1, 11, and 21 were drawn to a die coupled to the substrate via metal layers wherein the flap portions are coupled to the upper surface of the die; while amended Claims 1, 11, and 21 are drawn to a die wire-bonded and encapsulated to the metal layers wherein the flap portions are coupled to the upper surface of the encapsulant." Applicant disagrees with the Examiner's characterization of the original claims and the amended claims in that the Examiner's use of certain terms is incorrect. The original and amended claim language has been accurately disclosed above.

Amended claim 1, and similarly amended Claims 11 and 21, all relate to the semiconductor stacking structure elected and described in the specification and drawings as originally filed. The claims have been refined to define the invention and to traverse the Examiner's rejection. Both the original claims and the claims as amended are considered to be relevant to the active solid state devices in Classification 257. The Examiner has cited no reason as to why or how the amendment directs claims 1-12, 21-26 and 29-30 to a non-elected invention other then to cite the language of the original claims and the amended claims.

The Examiner originally issued a Restriction Requirement on product versus process claims. Applicant elected to prosecute the product claims and continues to prosecute the product claims.

MPEP §803 states:

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent (MPEP § 806.04 - § 806.04(i)) or distinct (MPEP § 806.05 - § 806.05(i)).

Examiners must provide reasons and/or examples to support conclusions, but need not cite documents to support the restriction requirement in most cases.

The Examiner has made only conclusionary statements to show that the amended claims are "independent" or "distinct" as defined in MPEP § 802.01 from the elected product claims. In order to be "independent", the Examiner must show "that there is no disclosed relationship between the two or more subjects." (MPEP § 802.01) The Examiner has failed to show any reason why the claims as amended are unconnected in design, operation, or effect other than to cite the language of the claims. The amended claims withdrawn by the Examiner are directed to the same product elected and supported by the specification.

The Examiner has also failed to show how the amended claims are "distinct" from the claims as previously presented. In order to be "distinct", the Examiner must show that "two or more subjects as disclosed are related,... but are capable of separate manufacture,

use, or sale as claimed, AND ARE PATENTABLE (novel and unobvious) OVER EACH OTHER (though they may each be unpatentable because of the prior art)." (MPEP § 802.01) (Emphasis included) The Examiner has failed to show the two requirements above to support his allegation that the amended claims are "distinct" from the claims as previously presented. The amended claims withdrawn by the Examiner are directed to the same invention elected and supported by the specification. The amended claims are a result of the prosecution history and for not claiming a distinct species.

The Examiner further contends in an Office Action dated October 19, 2004 and also in an Office Action dated April 5, 2005, that "since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 1-12, 21-26, 29 and 30 are withdrawn from consideration as being directed to a non-elected invention." Amended Claim 1, and similarly amended Claims 11 and 21, all relate to the semiconductor stacking structure elected and described in the specification and drawings as originally filed.

In the Office Action dated May 19, 2005, the Examiner for the first time tries to clarify his position by stating that wirebonds change the nature of the connection of the folded flaps. The Examiner contends that the "difference in the relative positioning

of the flaps is the mutually exclusive characteristic that serves the basis of the species restriction." Applicant respectfully disagrees. A "mutually exclusive characteristic" does not form the basis for a Restriction Requirement. As stated above, Restriction Requirements are defined by MPEP §803 which states:

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent (MPEP § 806.04 - § 806.04(i)) or distinct (MPEP § 806.05 - § 806.05(i)).

Examiners must provide reasons and/or examples to support conclusions, but need not cite documents to support the restriction requirement in most cases.

The "mutually exclusive characteristic" standard established by the Examiner is an improper standard for basing a Restriction Requirement since it has no basis in law or the MPEP. According to the MPEP, a Restriction Requirement is proper if the Examiner can show "independent" or "distinct" inventions as defined in MPEP § 802.01 and not "mutually exclusive characteristic" as claimed by the Examiner.

Furthermore, Applicant submits that the Examiner is incorrect in stating that the claims presented in the Amendment Letter dated August 6, 2004 are drawn to a different invention from the claims previously examined in the Amendment Letter dated February 23, 2004. In an Amendment Letter dated February 23, 2004, Applicant amended claims 1, 11, and 21. Claim 1 as amended February 23, 2004

reads as follows:

1. A semiconductor stacking structure comprising:

a first semiconductor device; and
a flexible tape substrate having metal layers for electrical connections wherein the flexible tape substrate is coupled to a bottom surface of the first semiconductor device via the metal layers, the flexible substrate being folded over on at least two sides to form flap portions which are coupled to an upper surface of the first semiconductor device, the flap portions not overlapping one another and covering only a portion of the upper surface of the first semiconductor device which is smaller than the upper surface of the first semiconductor device, the flexible substrate used for stacking additional semiconductor devices on the flap portions wherein the additional semiconductor devices are coupled to the metal layers of the flexible substrate.

Claim 1 as amended in the Amendment Letter dated February 23, 2004 is generic and covers all the embodiments depicted in Figures 1-6. Thus, Applicant did not constructively elect a specific embodiment as stated by the Examiner. Applicant amended claim 1 in an Amendment Letter dated August 6, 2004 to further define details of the semiconductor device. Claim 1 as amended August 6, 2004 reads as follows:

1. A semiconductor stacking structure comprising:
a semiconductor die;
a flexible tape substrate having at least one metal layer for electrical connections wherein the flexible tape substrate is coupled to a bottom surface of the semiconductor die;
wirebonds for electrically coupling the semiconductor die to the metal layer; and
an encapsulant covering the semiconductor die and the wirebonds;
wherein the flexible tape substrate further comprises a plurality of flap portions and each flap

portion is folded along a side surface and an upper surface of the encapsulant;

wherein the flap portions do not over lap one another and cover only a portion of the upper surface of the encapsulant;

wherein the folded flap portions have an exposed metal layer.

The Amendment Letter dated August 6, 2004 further defines the semiconductor stacking structure. Thus Applicant submits that the claims presented in the Amendment Letter dated August 6, 2004 are drawn to the same invention as the claims previously examined in the Amendment Letter dated February 23, 2004.

PETITIONED ACTION

Based on the facts stated above, Applicant respectfully Petitions that the Director instruct the Examiner to take the appropriate course of action as indicated by the above-stated facts and that the Director reverse the Examiner's withdrawal from consideration of pending claims 1-12, 21-26, and 29-30 as being directed to a non-elected invention.

To the best of my knowledge and belief, I aver that the above-stated STATEMENT OF FACTS represents an accurate and true account of the events and communications stated therein.

It is not believed that this Petition requires any fee, but if there is a fee incurred by this Petition, please deduct it from our Deposit Account NO. 23-0830.

Respectfully submitted,



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